Eq. Cat.	Sec	Item
R3	8.7	21

MOTOROLA

"PAC-TR" VEHICULAR REPEATER SYSTEM

For Conventional Portable/ Trunked Mobile Multiple Vehicle Applications

150.7-174 MHz
450-470 MHz
250 mW RF Power Output

PAC•TR Vehicular Repeater System for Conventional Portable/Trunked Mobile Radios

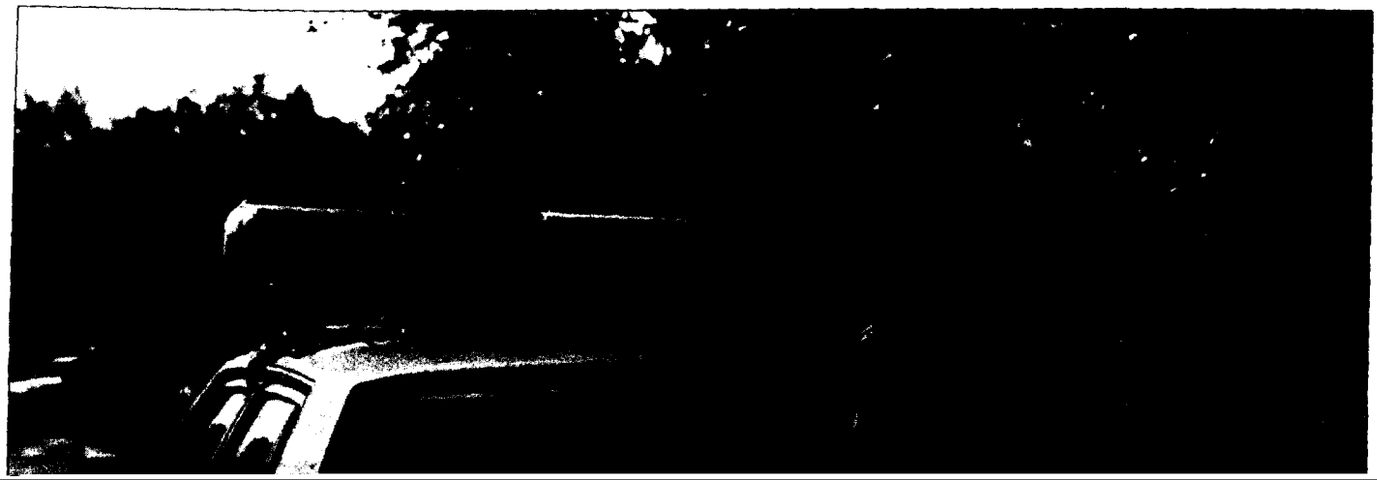
Motorola's PAC•TR Vehicular Repeater System is designed to expand the flexibility of your trunked mobile radio. Using a conventional UHF or VHF portable radio, you can step away from your car or truck and still maintain communications with members of your trunked fleet. The conventional portable radio serves as a wireless remote speaker/microphone for the trunked mobile. You can also communicate on-site with other portable radio units. Thus, you realize a double benefit: Access to your high-power, trunked mobile from hand-held radios (for example, the pager-sized EXPO portable radio), and portable-to-portable, on-site UHF or VHF communications. The result is a new dimension in trunking communications flexibility – extended communications coverage you can carry with you.

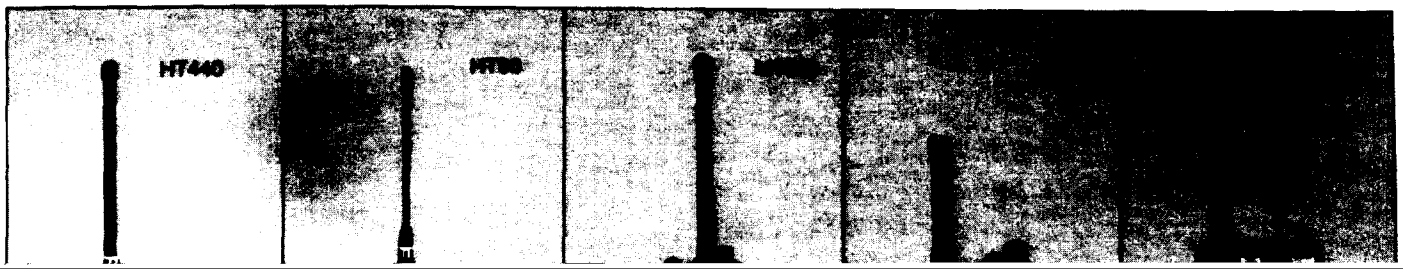
The PAC•TR system is designed for situations where similarly equipped vehicles are likely to be at a scene or in an area at one time. The system virtually eliminates the activation of several vehicular repeaters at the same time. The chance of one unit interfering with others is greatly reduced, maximizing the efficiency of your communications. The system consists of a UHF or VHF PAC•TR Repeater, a UHF or VHF Portable Radio, a Control Unit/Charger or Switch Kit, an Interface Cable that mates the repeater to a new or existing trunked mobile radio, and an Antenna connected to the repeater.

The Motorola PAC•TR Vehicular Repeater System is unbeatable for timely and dependable communications. It offers the range of a mobile, the versatility of a portable, trunked and conventional communications, and the reliability you've come to expect from Motorola.

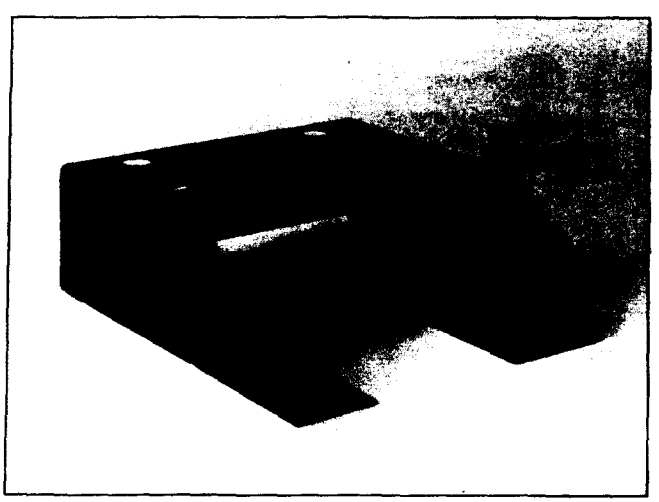
DESCRIPTION	ADVANTAGE
With PAC•TR Repeater Systems, a conventional UHF or VHF portable radio serves as a wireless, remote speaker/microphone for the trunked mobile in the vehicle.	With a portable radio in hand, you can step out of your vehicle and remain in contact with your fleet. You retain access to the trunked system via the repeater when you are working near your vehicle or inside a building.
With a low-power, conventional portable radio (EXPO, MT500, MX300, or HT90/HT440 radio), you remain in contact with the trunked system via the high-power mobile in your vehicle.	You enjoy wide area, extended trunked coverage from a small and easy-to-carry radio. The PAC•TR Repeater System resolves the range limitations of a portable radio.
With the PAC•TR Repeater, you retain access to as many as 20 available channels in your trunked system.	With multiple channel availability, you can access the system faster.

FEATURE	DESCRIPTION	ADVANTAGE
Trunked or Conventional Communications	Using your portable in the "talkaround" mode you can communicate with other portables on-site while monitoring the trunked system.	You can have both trunking and conventional on-site communications with the flip of a switch. Because you can monitor the trunked system, you won't miss important messages.



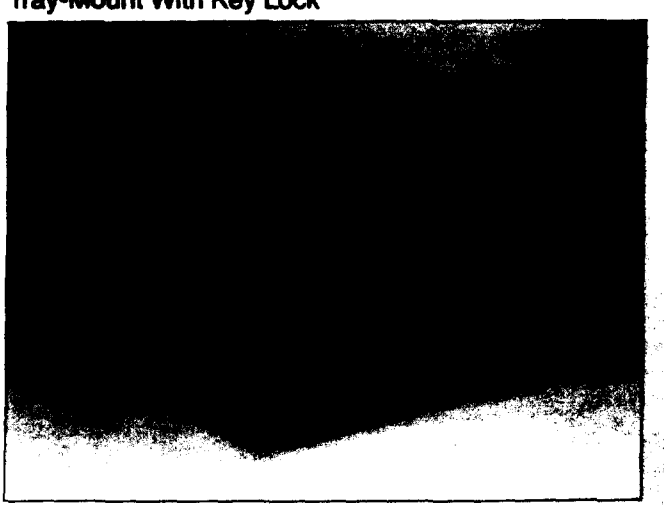

HT440

Feature	DESCRIPTION	ADVANTAGE
Solid Construction	Motorola uses high quality, state-of-the-art, solid state circuitry in the PAC•TR Repeater System. All removable boards are plug-in. The housing is made of durable, high impact 16-gauge steel.	The solid state circuitry ensures reliability and extended product life. Plug-in circuit boards allow ease of repair. The housing is strong enough to stand up to a rugged environment.
Time-Out Timer	The time-out timer is a standard, built-in feature. It's adjustable from approximately 1.5 to 2.5 minutes.	The timer prevents prolonged system tie up if you accidentally key the portable for an extended period of time.
Balanced System Range	The communications range between the PAC•TR Repeater and the portable radio is equivalent by design. If the portable radio can reach the repeater, the repeater can reach the portable radio.	This decreases the chances of "missed" or "one-way" communications.
Piggy-Back Mounting Bracket	A bracket is available for installation of the PAC•TR Repeater. This accessory allows you to stack the PAC•TR Repeater on top of the mobile in the trunk of your vehicle.	The bracket simplifies the installation of the PAC•TR Repeater/Trunked Mobile and saves trunk space as well.
Tray-Mount with Key Lock	The PAC•TR Repeater fits in its tray-mount housing with a key-lock.	This design secures your equipment and allows quick installation and removal for ease of service.
Unique Logic Design	With Motorola's unique logic design only one unit repeats communication. (Even if eight or more repeaters are in use in the same area, at the same time).	This eliminates the possibility of interference caused by the simultaneous activation of several repeaters. Communications reliability is therefore maximized and good system operation is ensured.



Piggy-Back Mounting Bracket

PAC•TR Vehicular Repeater
Tray-Mount With Key Lock



PAC•TR Vehicular Repeater System for Conventional Portable/Trunked Mobile Radios

Performance Specifications

General

	P1464-UHF P1465-VHF
Size:	2½"H x 10½"W x 12½"D (64 x 263 x 318mm)
	10 lbs. (4536g) less cables and charger
Attack (Priority):	500 msec. maximum
Temperature Range:	−30°C to +60°C, +25°C reference
Power Input:	13.8V dc, to ±15%
Singletone Encoder/Decoder:	Plug-In element: 800-1400 Hz; 847.5 Hz supplied
Time-Out Timer:	Two minutes ±0.5 minute
Channel Capability:	C1R1

UHF

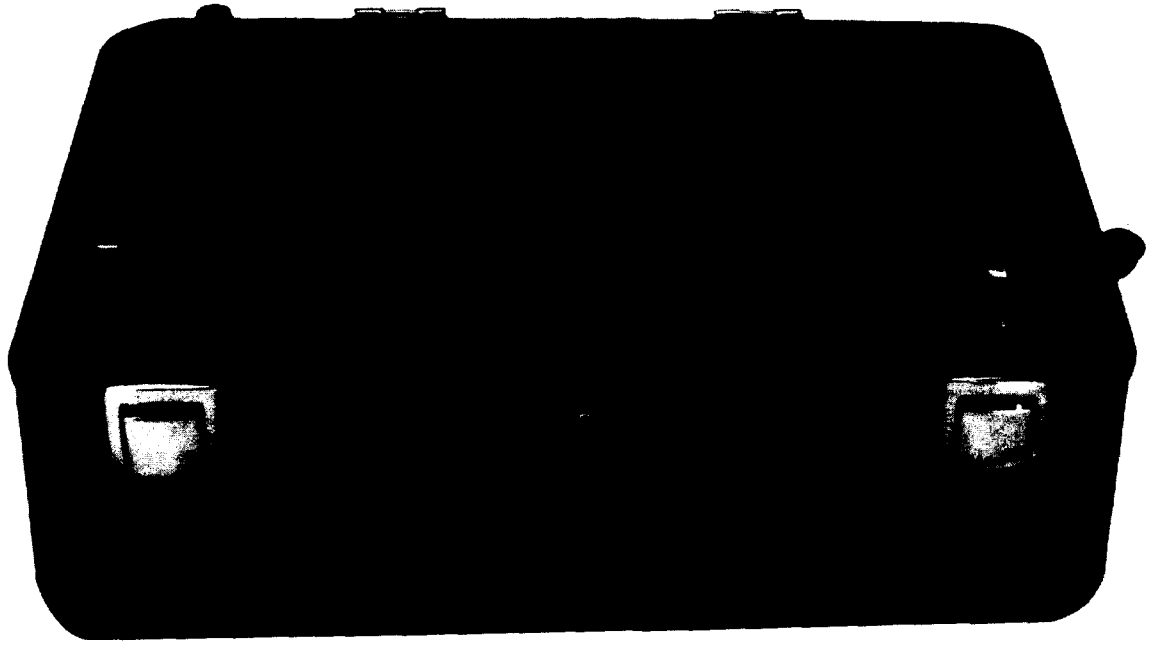
TRANSMITTER		RECEIVER	
Frequency Range:	450-470 MHz	Frequency Range:	450-470 MHz
RF Power Output:	250 mW minimum	Frequency Stability:	±.001%
Modulation:	16F3	Channel Spacing:	25 kHz
Frequency Stability:	±0.0005%	Current Drain:	350 mA
Current Drain:	500 mA	Sensitivity— 20 dB Quieting: 12 dB SINAD:	1.0 µV 0.8 µV
Audio Distortion:	5%	Squelch Sensitivity:	1.0µV (adjustable)
Audio Response:	+1, −3 dB referenced to 6 dB/octave pre-emphasis	Modulation Acceptance:	7 kHz
Conducted Spurious:	−40 dB	Intermodulation:	−60 dB
Deviation:	Continuously adjustable to ±5 kHz	Spurious Response and Image:	−50 dB
FCC Type Number:	CC4250	Selectivity:	−70 dB
		PL Decoder:	Plug-In reed: 67-192.8 Hz
		Audio Distortion:	5%
		Audio Level:	1.0V rms (nominal) into 100 Ohms
		Audio Response:	+2, −8 dB referenced to 6 dB/octave de-emphasis
		FCC Type Number:	RC0144

VHF

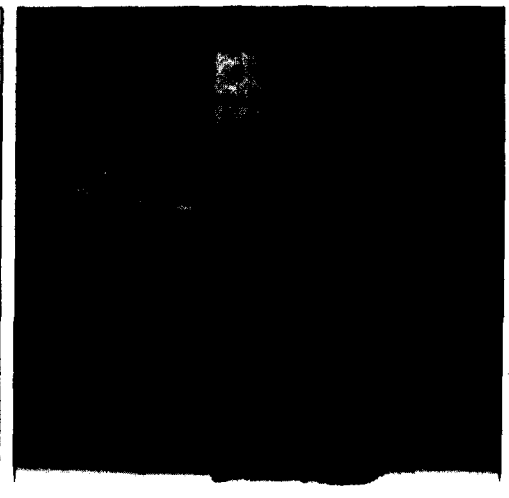
TRANSMITTER		RECEIVER	
Frequency Range:	150.7-174 MHz	[illegible]	150.7-174 MHz
RF Power Output:	250 mW minimum	[illegible]	±0.0015%
Modulation:	16F3	[illegible]	30 kHz
Frequency Stability:	±0.0005%	[illegible]	225 mA
Current Drain:	375 mA	[illegible]	0.75 µV 0.50 µV
Audio Distortion:	5%	[illegible]	1.0µV (adjustable)
Audio Response:	+1, −3 dB referenced to 6 dB/octave pre-emphasis	[illegible]	7 kHz
[illegible]	[illegible]	[illegible]	[illegible]

MOTOROLA

SECURENET
Portable Repeater
Clear and Coded Operation



The Portable Repeater is designed to help meet the communications needs of users who cannot be effectively serviced by a fixed repeater network. This Portable Repeater allows you to set up a base/repeater as part of a jump and run system in minutes, almost anywhere you need to, extending the coverage area of your portable-to-portable system. The Portable Repeater is dismantled just as quickly, so that you can move on to the next assignment.



Features

- **Self contained "briefcase" style**
- **Available in 2 modes**
  - **—Coded/clear**
  - **—Clear only**
- **Closed case operation**
- **Internal backup battery**

Portable Repeater

STANDARD
Feature/Advantage

Completely Self Contained Portable Unit—The complete repeater and all its accessories are contained in a compact briefcase style carrying case measuring only 18" × 13" × 7¼".

This inconspicuous black metal case can be easily carried by one person and set up in a matter of minutes.

Choice of Models—The Portable Repeater family includes units for SECURENET operation, as well as conventional two-way radio systems. SECURENET models operate in both the coded and clear modes.

There are models available to satisfy either standard voice communications needs or those applications requiring SECURENET voice security.

Up to 8 Channels—Any combination of eight repeater or optional simplex/base channels can be provided.

Maximum system flexibility is available through multi-frequency variable power and repeater/base modes of operation.

Low and High Power Modes—RF power output is switchable between low or high power modes. Full VSWR protection is provided in all models.

You can choose the power level which best meets your needs.

Emergency Internal Battery Backup—In the event of power main failure, the Portable Repeater will automatically revert to low power operation using its internal battery. On return to primary power, it will revert back to high power output and begin recharging its battery.

Communications are maintained in the event of power failure.

Local Speaker Microphone—Permits control of the repeater for dispatch operation. Local control has priority over the repeater path.

Communications flexibility is increased.

Weather Resistant Case—When closed the unit is weather resistant.

Transportable through most environmental conditions.

Optional Control Station Operation—The Portable Repeater may operate as a base station on simplex frequencies or be configured to act as a control station for a second repeater.

With flexible repeater/base operation, the Portable Repeater can talk to field units on simplex channels, act as a control station for a fixed repeater, or stand alone as the center of its own localized repeater system, providing you with a variety of system design alternatives.

Magnetic Mount Antenna—The antenna with its 12' cable can be mounted on the removable case lid and located at a remote site from the repeater (i.e., a hotel window or roof).

With the external "lid-mounted" antenna you can position the antenna where necessary for the best coverage under different site environments. (External vehicle and fixed antennas may also be used where available).

"SECURENET" SYSTEM
Feature/Advantage

High Level Security—The SECURENET system features sophisticated digital encryption (coding) techniques which prevent unintended listeners from overhearing any messages.

Your communication will remain private until you decide to make it public . . . not before. There is no need to swap radios or change frequencies, just switch to the coded mode . . . it's as simple as that. Protect your operators from unauthorized monitoring with the highest level of security.

Multiple Encryption Methods—Motorola offers several different types of encryption to choose from. While providing different system and operational features, all of the encryption types maintain the same high level of security Motorola is known for.

Motorola can tailor a SECURENET system to meet your security needs—whether it is interoperability between groups, fast system access or equivalent range in the nonencrypted and encrypted modes.

Automatic Coded/Clear Receive Operation—Lets you receive coded or clear messages without having to change to the appropriate receive mode.

Incoming messages are automatically switched to the proper mode without operator involvement. This reduces the possibility of missed messages due to the radio not being in the correct mode.

Clear Mode Alert Tone—When in the clear mode, an alert tone sounds when you depress the PTT switch.

This tone warns you that you are about to transmit information in a non-protected mode. Greatly reduces the possibility that private information could be transmitted on an unsecured channel.

"SECURENET" SYSTEM OPTIONS

Delete/Omit Internal Duplexer—The standard internal duplexer may be omitted to allow use with a custom external duplexer or separated antennas.

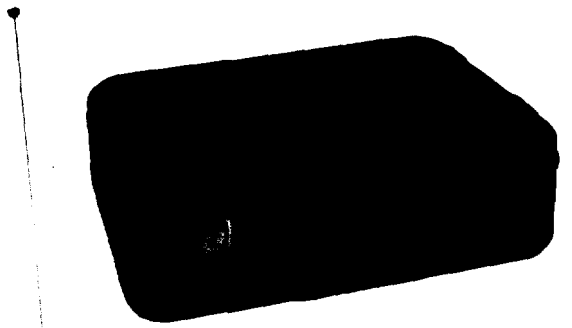
Additional flexibility for repeat separation and bandwidth.

Proper Code Detect—Mutes the speaker if the received code does not match the code programmed into the radio.

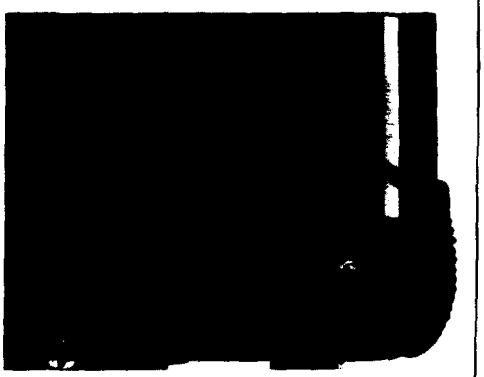
You hear only those transmissions encrypted with your individual key. Eliminates annoying noises typically heard when operating on a multi-coded channel or system.

Transparent Operation—The SECURENET portable repeater provides transparent repeater operation—automatic repeat of coded and clear signals.

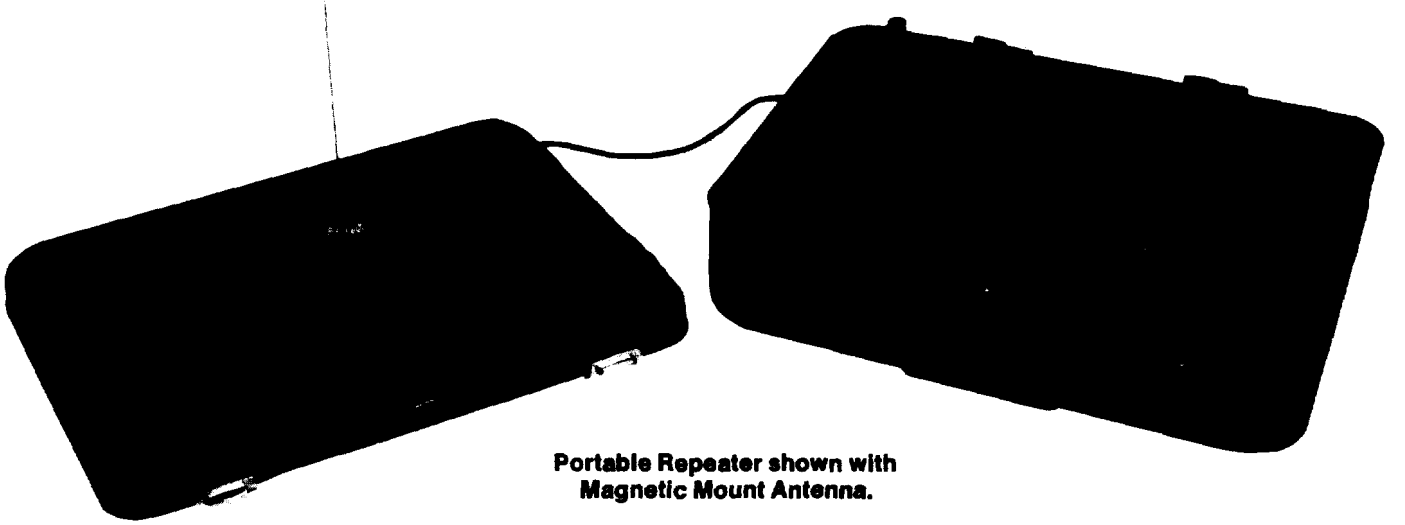
In a stand alone application the SECURENET repeater will handle signals from both coded and clear units without operator intervention.



Portable Repeater closed for transportation.



Close-up of SECURENET Coded Control Panel.



Portable Repeater shown with Magnetic Mount Antenna.

Portable Repeater

Performance Specifications

Security

Encryption Type:	Digital
Coding Method:	Multi-register half non-linear combiner
Number of Codes:	Dependent on encryption type
Synchronization:	Self synchronizing or counter addressing
Code Key Initialization:	Internally derived pseudo-random initializing vector
Code Key Generation:	External hand held microprocessor controlled code inserter
Code Storage:	Volatile electronic memory
Analog to Digital Conversion:	Continuously Variable Slope Delta Modulation (CVSD)
Voice Sample Rate:	12 k Bit/Sec

General Radio (All Models)

	VHF	UHF
SECURENET Model Series:	P43SXS	P44SXS
Clear Only Model Series:	P43SYS	P44SYS
Channel Spacing:	30 kHz	25 kHz
Squelch:	Carrier, "Private-Line" Squelch	
Number of Frequencies:	8	
Size (Excluding Handle and Feet):	13" × 18" × 7¼" (33 × 45.7 × 18.42 cm)	
Weight (Including accessories):	33 lbs. (14.97 kg.)	
Operating Range:	−30°C to +60°C	
Power Supply:	115 ±20% V ac (50-60 Hz), 13.8 ±20% V dc, Internal backup battery, (115-230V ac, 50-60 Hz Optional)	
Current Drain* (13.8V dc)		
High Power Tx:	9.0 AMP	
Low Power Tx:	1.5 AMP	
Rcv. Only (500 mW Audio):	.4 AMP	
Standby:	.2 AMP	

*For Non-Repeater Channel Add .3 AMP

Internal Emergency Battery	
Capacity @ 25°C:	Up to 1 hour low power transmit time, up to 8 hours standby
Charge time:	14 hours max.

	VHF	UHF	UHF
Frequency Range:	136-150.8 150.8-162, 162-174 MHz	403-430 440-512 MHz	(H949) 403-430 440-512 MHz
Repeat Freq. Separation (R-T):	3 MHz Min.	5 MHz Min.	3 MHz Min.
Repeat Freq. Spread Rcvr.:	300 kHz Max.	300 kHz Max.	300 kHz Max.
Repeat Freq. Spread Tx:	300 kHz Max.	300 kHz Max.	300 kHz Max.
Non-Repeat Freq. Spread Tx:	12 MHz Max.	6 MHz Max.	6 MHz Max.
Non-Repeat Freq. Spread Rcvr.:	2 MHz Max.[1]	1 MHz Max.[1]	1 MHz Max.[1]

[1] Receive Freq. spreads of up to 5 MHz possible with following degradation.

VHF Receiver spread	UHF Receiver spread
3 MHz-1 dB degradation	3 MHz-1 dB degradation
4 MHz-3 dB degradation	5 MHz-3 dB degradation

Transmitter

	VHF	UHF
RF Power Output (High/Low)		
At Power Amplifier:	30 watt/1.7 watt	20 watt/1.0 watt
At Duplexer (Antenna Port):	20 watt/1.4 watt	12 watt/.8 watt
Spurious and Harmonics:	−71 dB	−59 dB
RF Frequency Stability (−30°C to +60°C, 25°C Ref.):	±0.0005%	±0.0005%
Modulation:		
Clear	16F3, 15F2, 16F9	16F3, 15F2, 16F9
Coded	20F3Y	20F3Y
FM Noise:	50 dB	50 dB
Audio Response:	+1, −3 dB from 6 dB/Octave Pre-emphasis 300 Hz to 3 kHz, *referenced to 1000 Hz.*	+1, −3 dB from 6 dB/Octave Pre-emphasis 300 Hz to 3 kHz, *referenced to 1000 Hz.*
Audio Distortion[2]:	5%	5%

[2] Specification applies to clear mode only. Performance in the coded mode has been tailored to deliver optimum intelligibility and voice recognition.

Receiver

	VHF	UHF
Modulation Acceptance:	±7.5 kHz	±7.5 kHz
Sensitivity[2]		
20 dB Quieting Rptr.:	.75 μV	.75 μV
12 dB SINAD Rptr.:	.525 μV	.525 μV
Selectivity (EIA SINAD):	90 dB	85 dB
Intermodulation (EIA SINAD):	80 dB	75 dB
Freq. Stability (−30°C to +60°C, +25°C Ref.):	±0.0005%	±0.0005%
Spurious and Image Rejection:	80 dB	80 dB
Audio Output:	500 mW	500 mW

FCC Designation*

	VHF	UHF
Transmitter:	CC3367	CC4325
Receiver:	RC0280	RC0282

SECURENET models licensable under FCC Rules and Regulations Part 90 for police and fire services.

Clear only models licensable under FCC Rules and Regulations Parts 21, 74, 90, 95.

For International usage, local PTT regulations apply, and U.S. State Dept. Munitions License is required for SECURENET models.

MOTOROLA

1301 E. Algonquin Road, Schaumburg, Illinois 60196
Telephone (708) 397-1000

Winner 1988 Motorola Building National Quality Award

MOTOROLA Communications

Support Services

Wherever Motorola sells, our product is backed by service. In the U.S., we have 900 authorized or company-owned centers. In addition, our products are serviced throughout the world by a wide network of company or authorized independent distributor service organizations.

Specifications subject to change without notice.

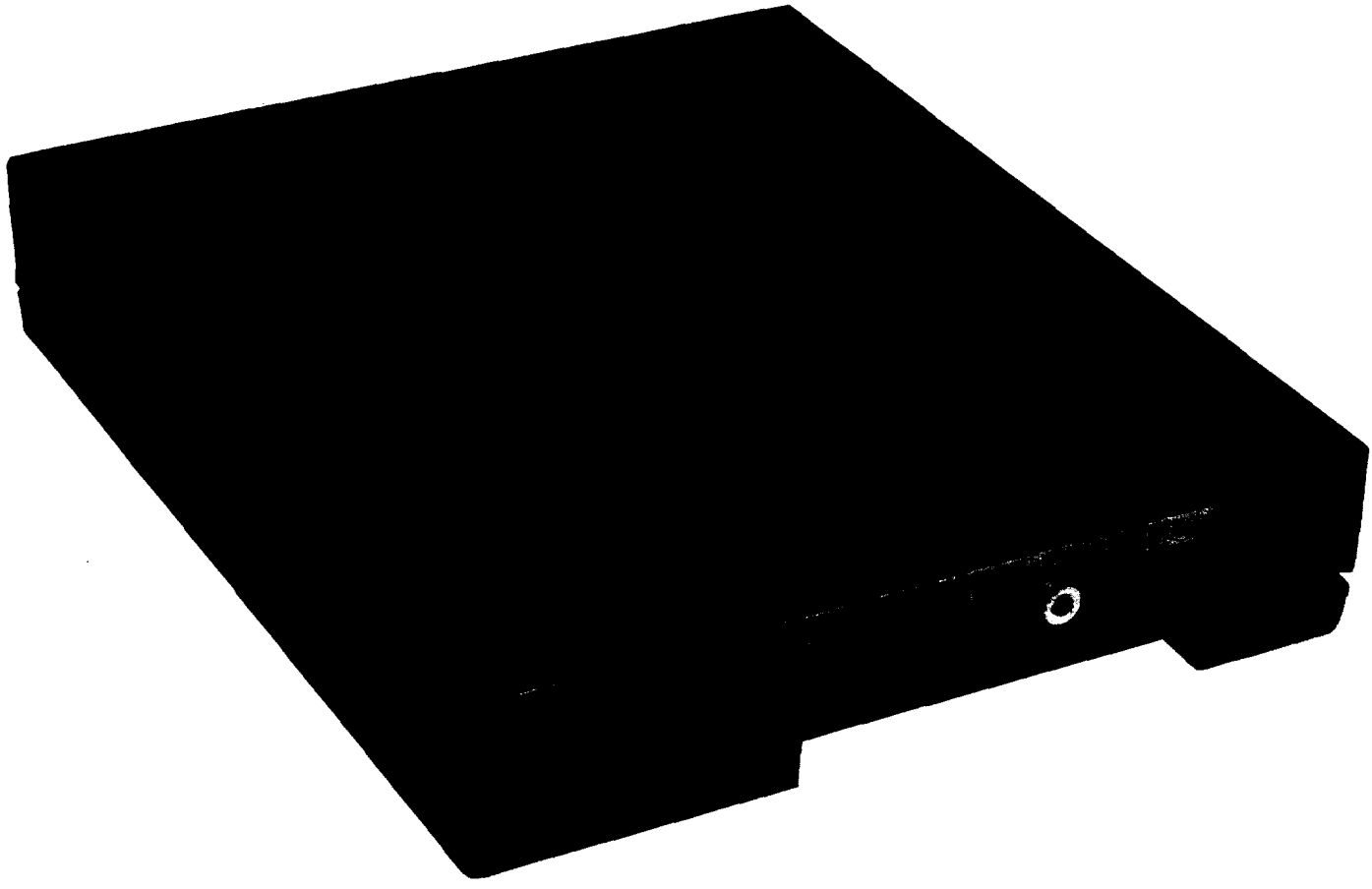
Eq. Cat.	Sec.	Item
R3	4	55F

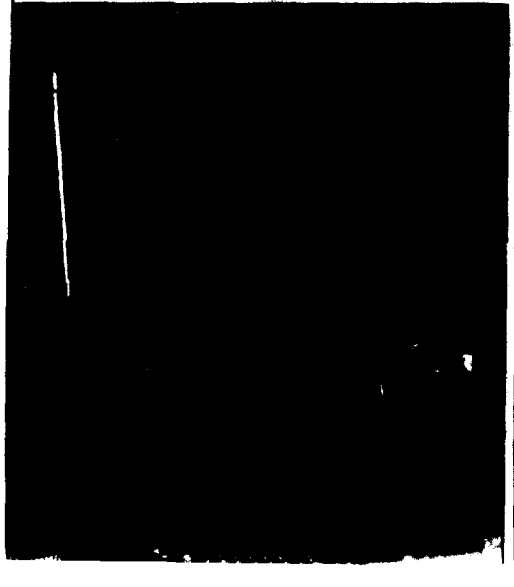
MOTOROLA

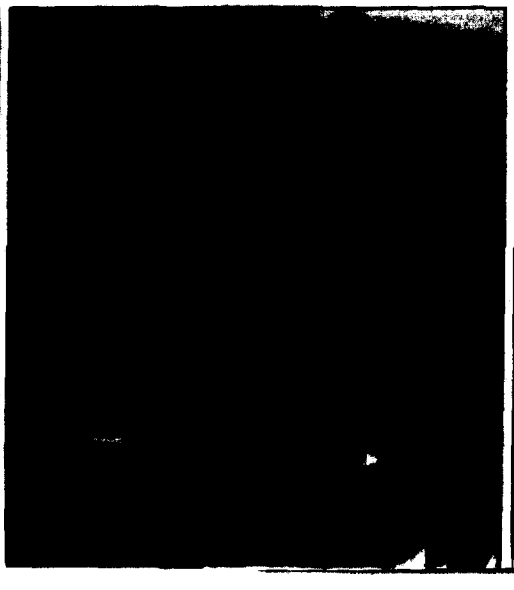
PAC•RT

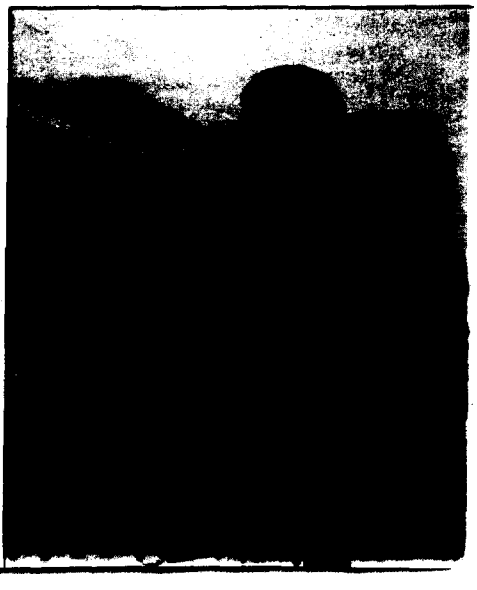
Portable/Mobile Vehicular Repeater System

150.7-174 MHz
450-470 MHz
250 mW RF Power Output





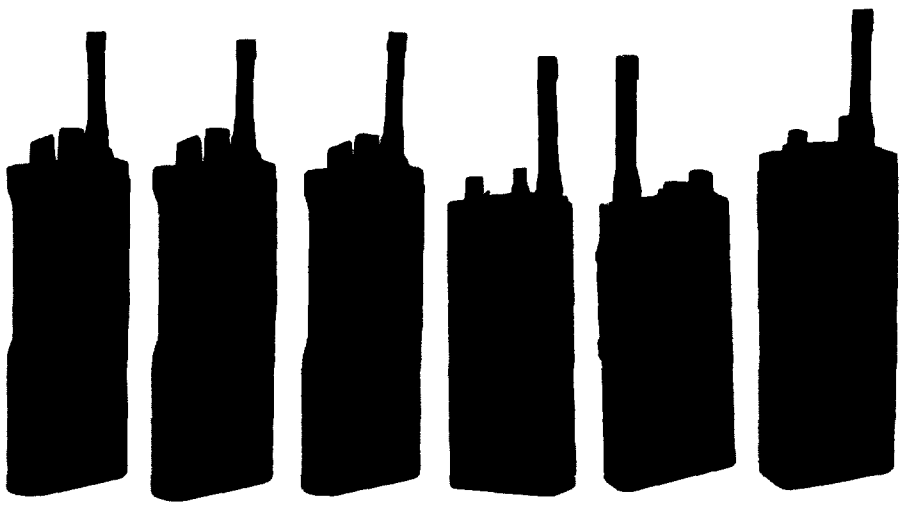




PAC•RT Portable/Mobile Vehicular Repeater System

Motorola's PAC•RT repeater system is designed to expand the flexibility of current mobile radio users. Using a HT600, HT50, HT90, HT440, MT1000, MT500, EXPO, SABER I, II, III, or MX300 portable radio allows your operators the flexibility of leaving their vehicles while still maintaining full communications with their base station, other mobile radios, or other portable radios in their communications system.

This system truly puts "communications on the man" and thereby maintains contact without tying him to his vehicle. Police officers, security guards, ambulance attendants, utility linemen, remote broadcasters, and surveillance teams are but a few of the many users who require out-of-the-vehicle communications to reduce the time in getting their jobs done quickly and safely. In fact, anyone who has the need to communicate and their work takes them away from their vehicle, will find that the PAC•RT repeater is the answer to their communications needs.



SABER I SABER II SABER III HT600 EXPO MT1000

PAC•RT/SYSTEM ADVANTAGES

Easy Add-On Capability – The PAC•RT repeater can be easily added to any existing trunk-mounted MICOR, MITREK, MOCOM-70, MOTRAC, MCX100, MCX1000, MARATRAC, MAXAR, SYNTOR, SYNTOR X, SYNTOR X 9000 TRUNKED or CONVENTIONAL or mobile radio. It can also be used with many non-Motorola trunk-mounted mobile radios.

The PAC•RT repeater unit installs between the existing mobile radio and control head. Add a portable radio, a control unit/charger or a switch kit, and an antenna and you're ready for total out-of-the-vehicle communications.

Unique Cross-Band Operation – The VHF PAC•RT repeater system is designed to operate with a high-band portable and either a low-band, UHF, or 800 MHz mobile radio. For portable-to-base operation, the user transmits from the high-band portable to the high-band PAC•RT receiver. The PAC•RT repeater unit, in turn, automatically activates the mobile transmitter which retransmits the portable message to the base station. The reverse is true for base-to-portable operation.

The UHF PAC•RT repeater system is designed to operate with a UHF portable and a low band, high band or 800 MHz mobile

Simplified Repeater Setup – *Automatic activation* of the repeater is accomplished by simply removing the portable radio from the MT1000 Vehicular Adaptor (MVA), SABER Vehicular Adaptor, or the control unit/charger. Likewise, when the portable is returned to the MVA, SVA, or control unit/charger, the repeater is automatically deactivated. The Basic MVA is compatible with the HT600 and MT1000 portable radios. The SVA is compatible with the SABER Series portables. Control unit chargers are available for HT90/440, MT500, HT600, MT1000 and MX300 series portables.

The police officer, fire chief, etc., doesn't have to remember to throw a switch to activate the repeater – it is done automatically. When the operator takes the portable out of the MVA, SVA or control unit/charger, the PAC•RT repeater is ready for operation. When the portable is returned, the repeater is shut down. Simple!

Manual activation of the repeater is available by the simple addition of an under-dash switch kit in place of a control unit/charger. The user activates the repeater by throwing a switch upon leaving the vehicle. A red light provides positive verification that the PAC•RT has been activated. The repeater must be manually disabled upon re-entry to the vehicle.

PAC•RT/SYSTEM ADVANTAGES

Unique Logic Design – Eliminates the possibility of interference caused by several repeaters being activated at the same time.

With Motorola's logic design, even if eight or more repeaters are being used in the same area at the same time, only one unit repeats communications. Virtually no chance exists for interference on the system, regardless of the number of units present in a one-half mile radius. Only one repeater will be activated. Thus, communications reliability is maximized and good system operation is ensured.

Portable Priority Interrupt – The priority interrupt feature, standard on Motorola's PAC•RT units, overcomes the traditional repeater-access problems when the mobile channel is active. Without priority the operator can get locked out of the system until the channel is clear, even though it may be only "skip" or some other interference tying up the channel. (In the vehicle, the operator could ignore such interference, press the mobile microphone switch, and communicate without delay.)

The priority interrupt feature gives the operator the same talk-back ability with the portable radio as is enjoyed with the mobile radio. This is accomplished by briefly interrupting the PAC•RT transmitter at intervals to look for a signal coming back from the portable radio. The interruption is minute so as not to lose any portion of the transmitted message. If a signal is sensed by the PAC•RT repeater, it clears the system and allows the portable user to access the repeater.

High Quality Construction – All Motorola PAC•RT repeater units use high quality, state-of-the-art, solid-state circuitry. All removable boards are plug-in, and feature captive screws. The housing is made of durable high-impact 16-gauge steel.

Solid-state circuitry provides reliability and extended life. Captive screws prevent loss and ensure proper installation and operation. The high-impact housing is strong enough for the most rugged of environments. And, using the tray mount with key lock, permits quick installation or removal of the PAC•RT repeater unit. It is easy to reach and easy to service.

Time-Out Timer – A built-in time-out timer feature is standard and is factory adjusted nominally from 1.5 minutes to 2.5 minutes.

The timer prevents prolonged system tie-up. Should the timer turn off the PAC•RT repeater, the logic circuit automatically removes the repeater from the priority state, allowing another unit in the system to assume the repeat function.

Base Repeater Option – For UHF and 800 MHz systems. May be used in lieu of the mobile detect option in systems where all 2 frequency simplex mobile channels are assigned as repeater pairs.

Also fits in standard PAC•RT repeater housing; is space efficient.

Mobile Detector* – The Mobile Detector option is required when the mobile radio frequency scheme uses different transmit and receive frequencies (such as a two-frequency simplex system) and there are no base or fixed repeaters in the system. Through the use of the Mobile Detector option, the PAC•RT repeater senses traffic on the mobile channel and ensures that multiple repeaters in the same area are not keyed.

All Mobile Detector options fit within the standard PAC•RT repeater housing. A separate housing is thereby eliminated.

In Car Monitor With Talk Back – This optional feature is designed for use in two-person vehicle applications.

It provides the user remaining in the vehicle with the capability to monitor all portable-to-base communications and talk back directly to the portable user. This feature offers a 12-Watt Speaker/Amplifier and a dash-mounted ICM Control Housing which controls the three operational modes as well as repeater on/off. Charging capability in the vehicle is available through the use of the appropriate vehicular charger.

Piggyback Mounting Bracket – A special piggyback mounting bracket is available as an accessory to provide space-saving utility through trunk-mounting the repeater and mobile radio in a stacked arrangement. This heavy-gauge steel bracket is designed for use with all Motorola trunk-mounted mobiles and several competitive mobiles.

This bracket helps simplify the installation of the PAC•RT repeater and reduces the space required for mounting the repeater and mobile radio. Servicing and access to both units is also enhanced by Motorola slide-out radio housings.

Improved Frequency Stability – In VHF versions of the PAC•RT repeater, a ±.0005% channel element is available in place of the standard ±.002%.

This option provides maximum frequency stability for those who demand the best performance for their system.

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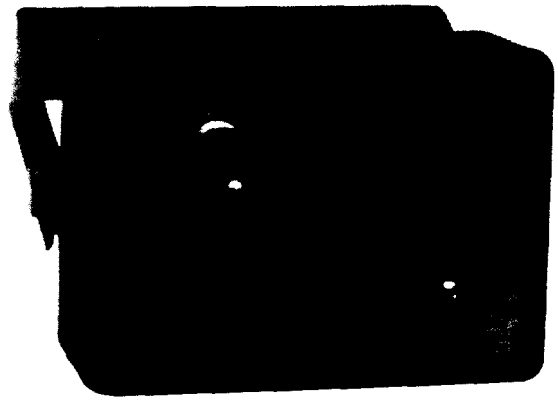
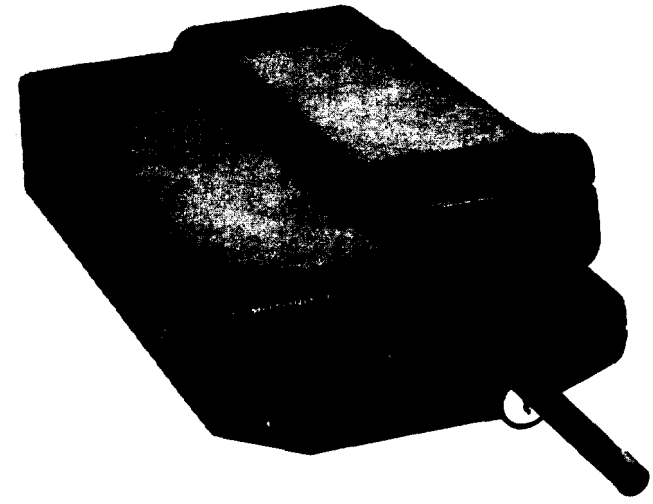
*Not available on 800 MHz.





PAC•RT Portable/Mobile Vehicular Repeater System

Performance Specifications

General

Model:	H13TTY3110 (VHF) H14TTY3110 (UHF)
Dimensions:	2½"H x 10½"W x 12½"D (64 x 263 x 318 mm)
Weight:	10 lbs. (4536g) less cables and charger
Attack Time: (Priority Unit)	300 msec. maximum
Temperature Range:	– 30°C to + 60°C + 25°C reference
Power Input:	13.8V dc, to ±15%
Singletone Encoder/Decoder:	Plug-In element: 800-1400 Hz; 847.5 Hz supplied
Time-Out Timer:	Two minutes ±0.5 minute
Channel Capability:	C1R1

VHF

TRANSMITTER	
Frequency Range:	150.7-174 MHz
RF Power Output:	250 mW minimum
Modulation:	16F3
Frequency Stability:	±0.002% standard ±0.0005% optional
Current Drain:	375 mA
Audio Distortion:	5%
Audio Response:	+ 1, – 3 dB referenced to 6 dB/octave pre-emphasis
Conducted Spurious:	– 40 dB
Deviation:	Continuously adjustable to ±5 kHz
FCC Type Number:	CC3272

RECEIVER	
Frequency Range:	150.7-174 MHz
Frequency Stability:	±0.0015%
Channel Spacing:	30 kHz
Current Drain:	225 mA
Sensitivity– 20 dB Quieting: 12 dB SINAD:	0.75µV 0.50µV
Squelch Sensitivity:	1.0µV (adjustable)
Modulation Acceptance:	7 kHz
Intermodulation:	– 70 dB
Spurious Response and Image:	– 70/60 dB
Selectivity:	– 80 dB
PL Decoder:	Plug-In reed: 67-192.8 Hz
Audio Distortion:	5%
Audio Level:	1.0V rms (nominal) into 100 Ohms
Audio Response:	+ 2, – 8 dB referenced to 6 dB/octave de-emphasis
FCC Type Number:	RC0112

UHF

TRANSMITTER	
Frequency Range:	450-470 MHz
RF Power Output:	250 mW minimum
Modulation:	16F3
Frequency Stability:	±0.0005% standard
Current Drain:	500 mA
Audio Distortion:	5%
Audio Response:	+ 1, – 3 dB referenced to 6 dB/octave pre-emphasis
Conducted Spurious:	– 40 dB
Deviation:	Continuously adjustable to ±5 kHz
FCC Type Number:	CC4250

RECEIVER	
Frequency Range:	450-470 MHz
Frequency Stability:	±.001%
Channel Spacing:	25 kHz
Current Drain:	350 mA
Sensitivity– 20 dB Quieting: 12 dB SINAD:	1.0µV 0.8µV
Squelch Sensitivity:	1.0µV (adjustable)
Modulation Acceptance:	7 kHz
Intermodulation:	– 60 dB
Spurious Response and Image:	– 50 dB
Selectivity:	– 70 dB
PL Decoder:	Plug-In reed: 67-192.8 Hz
Audio Distortion:	5%
Audio Level:	1.0V rms (nominal) into 100 Ohms
Audio Response:	+ 2, – 8 dB referenced to 6 dB/octave pre-emphasis
FCC Type Number:	RC0144

LOW BAND MOBILE DETECTOR (Optional)

Frequency Range:	30-50 MHz
Number of Channels:	1 to 4
Modulation Acceptance:	7 kHz
Frequency Stability: (– 30°C to + 60°C; + 25°C ref)	± .005%
Selectivity:	– 40 dB
Spurious Response:	– 40 dB
Squelch Sensitivity:	1µV
Sensitivity: (20 dB Quieting)	1µV
FCC Type Number:	RC0115

HIGH BAND VHF MOBILE DETECTOR (Optional)

Frequency Range:	150.8-174 MHz
Number of Channels:	1 to 4
Modulation Acceptance:	7 kHz
Frequency Stability: (– 30°C to + 60°C; + 25°C ref)	±0.0025%
Selectivity:	– 70 dB
Spurious Response:	– 50 dB
Squelch Sensitivity:	1µV
Sensitivity: (20 dB Quieting)	1µV
FCC Type Number:	RC0112

UHF MOBILE DETECTOR (Optional)

Frequency Range:	450-512 MHz
Number of Channels:	1 to 4
Modulation Acceptance:	7 kHz
Frequency Stability: (– 30°C to + 60°C; + 25°C ref)	± .001%
Selectivity:	– 70 dB
Spurious Response:	– 50 dB
Squelch Sensitivity:	1µV
Sensitivity: (20 dB Quieting)	1µV
FCC Type Number:	RC0143

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MOTOROLA

PAC • PL Portable/Mobile Vehicular Repeater System

150.7 - 174 MHz
450 - 470 MHz
250 mW RF Power Output

Features

Vehicular Repeater System

Cross Band Operation

- In order to minimize interference and eliminate

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PA
Vehi

PL Tone Generator

The PL tone generator option is required for all carrier squelch systems. ● It provides PL protection from co-channel interference to the portable unit by re-transmitting the carrier squelch message with the PL code of the portable. This option is not required for coded squelch systems.

In-Car Monitor With Talkback Option

For two-man vehicles, the In-Car Monitor with Talkback Option provides monitoring and talkback capability on the portable and mobile channels for an operator remaining inside the vehicle. ● This feature allows the in-vehicle operator to remain in contact with the base station or other mobiles and the portable operator, which can improve the coordination safety, and effectiveness of the two-man team.

Portable Priority Interrupt

The Portable Priority Interrupt feature gives the portable radio operator the same talk-back ability via the portable radio as is enjoyed by the mobile radio operator. This is accomplished by briefly interrupting the PAC•PL transmitter at short intervals to look for a signal coming back from the portable radio. The transmitter interruption does not affect the intelligibility of the transmitted message. ● Portable Priority Interrupt prevents the operator from being "locked out" of the system until the channel is clear, even though it may only be "skip" or some other interference tying up the channel. (In the vehicle the operator could ignore such interference, press the mobile PTT and communicate without delay.)

[redacted]-PL Portable Mobile Vehicular Repeater System

Performance Specifications

General

[redacted]	H13RPY3110 (VHF)–PL Model–H14RPY3110 (UHF) H13RPY6110 (VHF)–DPL Model–H14RPY6110 (UHF)
[redacted]sions:	2½"H x 10½"W x 12½"D (64 x 263 x 318mm)
[redacted]ght:	10 lbs. (4536g) less cables and charger
[redacted]ttack Time: (Priority Unit)	300 msec. maximum
Temperature Range:	–30°C to +60°C, +25°C reference
Power Input:	13.8 V dc, to ±15%
Time-Out Timer:	Two minutes ±0.5 minute
Channel Capability:	C1R1

VHF

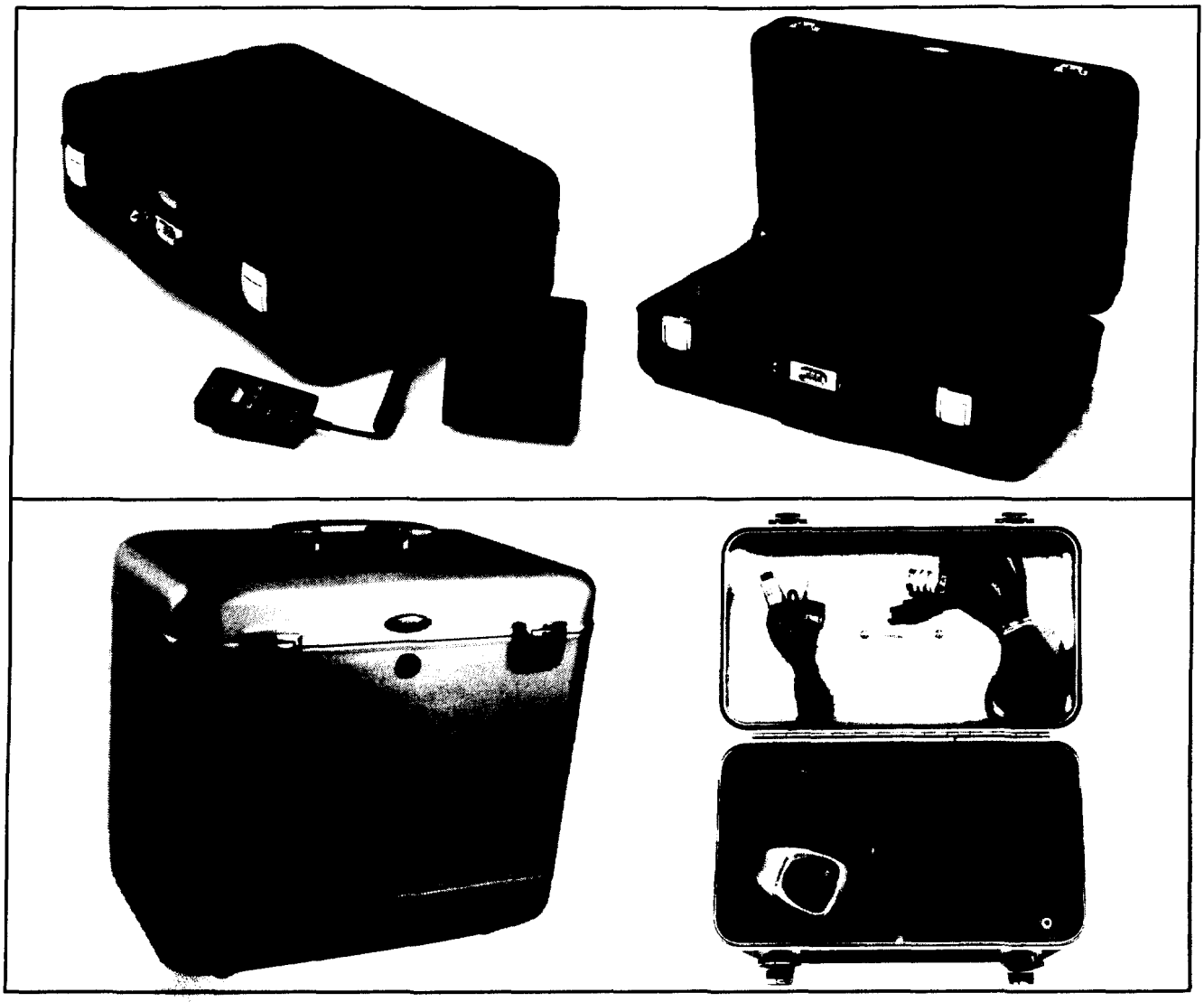
TRANSMITTER	
[redacted] Range:	150.7 - 174 MHz
[redacted] Output:	250 mW minimum
[redacted]	16F3
[redacted] Stability	±0.002% Standard ±0.0005% Optional
[redacted]	375 mA
[redacted]	5%
[redacted]	+1, –3 dB referenced to 6 dB/octave pre-emphasis
[redacted]	–40 dB
[redacted]	Continuously adjustable to ±5 kHz

RECEIVER	
[redacted]	150.7 - 174 MHz
[redacted]	±0.0015%
[redacted]	30 kHz
[redacted]	225 mA
[redacted]	0.75uV 0.50uV
[redacted]	1.0 uV (adjustable)
[redacted]	7 kHz
[redacted]	–70 dB
[redacted]	–70/60 dB

MOTOROLA

SVA TRANSPORTABLE/ MOBILE BASE STATIONS

MID BAND, HIGH BAND, AND UHF



Motorola's SVA Stations are compatible with any SABER Radio, including SECURNET. Law enforcement command posts, emergency response teams, fire fighting support, temporary use in rental vehicles, surveillance, military bases, and airfields are among potential applications for this highly versatile product.

KEY FEATURES

- TWO LIGHTWEIGHT PACKAGES
- 40 WATT VHF, 30 WATT UHF-RF
- PTT OR TOUCH CODE MICROPHONE
- 115/220 VAC OR 12 VDC CAPABLE
- COMPATIBLE WITH ANY SABER RADIO
- SECURENET CAPABLE
- SURVEILLANCE READY (TAPE RECORD)
- CLOSED CASE COVERT OPERATION

SVA TRANSPORTABLE/MOBILE BASE STATIONS

MODEL P1750A VERTICAL CASE STYLE

CASE TYPE/SIZE	SILVER ALUMINUM 15″ HIGH X 9″ ACROSS X 14″ WIDE (38.1 X 22.9 X 35.6cm)
WEIGHT	27 LBS. (12.2kg.)
RF POWER	40 WATTS HIGH BAND, 30 WATTS UHF, 40 WATTS MID BAND
MICROPHONE	PTT PALM MICROPHONE
SPEAKER	5 WATTS
CONTROL PANEL	POWER ON/OFF, ANTENNA CONNECTOR (UHF), HEADPHONE JACK, NOISE CANCELLING HEADSET JACK, TAPE RECORDER JACK, 115/220 VAC SWITCH, AC/DC POWER CONNECTOR, RF PA ON/OFF SWITCH, AC/DC FUSES
POWER SUPPLY	115/220 VAC LINE OPERATED POWER SUPPLY (50-60 HZ)
CABLES SUPPLIED	115/220 VAC POWER CABLE, 12 VDC POWER CABLE WITH CIGARETTE LIGHTER PLUG

MODEL P1755A HORIZONTAL CASE STYLE

CASE TYPE/SIZE	CARBIDE BLACK 7″ HIGH X 13″ ACROSS X 21″ WIDE (17.8 X 33.0 X 53.3cm)
WEIGHT	27 LBS. (12.2.kg.)
RF POWER	40 WATTS HIGH BAND, 30 WATTS UHF, 40 WATTS MID BD.
MICROPHONE	PTT PALM MICROPHONE
SPEAKER	5 WATT WITH 10 FT. EXTENSION CORD FOR REMOTE
CONTROL PANEL	POWER ON/OFF, ANTENNA CONNECTOR (UHF), HEADPHONE JACK, NOISE CANCELLING HEADSET JACK, TAPE RECORDER JACK, 115/220 VAC SWITCH, AC/DC POWER CONNECTOR, REMOTEABLE SPEAKER, MOUSEHOLE, RF PA ON/OFF SWITCH, AC/DC FUSES
POWER SUPPLY	115/220 VAC LINE OPERATED POWER SUPPLY (50-60 HZ)
CABLES SUPPLIED	115/220 VAC POWER CABLE, 12 VDC POWER CABLE/PLUG

FCC DESIGNATIONS RF PA:

	TYPE ACCEPTANCE NUMBER
VHF (N1247) 40 WATTS,	AZ489FC3359
UHF (N1275) 30 WATTS,	AZ489FC5603

MID BAND NOT TYPE ACCEPTED, FOR EXPORT ONLY

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MOTOROLA

Spectra-TAC
Satellite Receiver Voting System

132-174 MHz 450-512 MHz
406-420 MHz 806-821 MHz

Spectra-TAC satellite receiver voting system

- **Highest Audio Quality**
- **Maximum System Flexibility**
- **Easy Serviceability**
- **Solid State Integrated Circuit Reliability**
- **Data Handling Capability**
- **Status Tone 13 dB Below Audio**

The Industry's First Receiver Voting System With:

- **Path Loss Factoring**
- **Path Response Compensation**
- **Superior Receiver Shielding and Filtering**
- **"Smart" Notch Filter**—Does Not Degrade Voice**

A user equipped with a portable radio has a limited talk-out range, though his receiver can easily pick up the powerful base station transmitter. A practical way to increase this range is to supplement the base station receiver with a satellite receiver located within range of the portable. More such receivers placed throughout a given area insure that no matter where the user is, the portable can be picked up on one of these satellite receivers. This setup constitutes a Total Area Coverage (TAC) system. The process of comparing and selecting the best signal when a portable reaches two or more satellites is known as receiver voting.

The Spectra-TAC satellite receiver voting system provides the user on foot with a dramatic increase in range and effectiveness of vital communications.

Receiver

The Spectra-TAC satellite receiver is an integrally packaged unit consisting of an RF-IF section, power supply, audio control module, and encoder module. Depending on system design, the unit ator. Signals from these modules also enable the system to compensate for varying phone line loss and poor frequency response, and to check for phone line outage.

Comparator

The Comparator evaluates the quality of the audio from the remote receivers and selects the receiver with the best audio.* This selection is a continuous process. The selected audio is then sent to a transmitter or to a dispatcher console, or to both, depending on system needs. The Comparator is modular in construction, with the basic unit accommodating a command module, a power supply and up to 8 Signal Quality Modules, which makes it capable of handling up to 8 remote receivers. Other models are available for greater system requirements. The Comparator power supply provides a constant regulated voltage to the unit. As with the receiver, the Comparator will continue to function during power company brown-outs, and the supply has the capability to charge an optional emergency battery which can power the unit if power fails. The command module provides the necessary audio amplification required in the system. The Signal Quality Modules make continuous measurements of the received audio quality. Both comparison and reselection are continuous, a necessary feature since a user on patrol often moves from the best coverage area of one receiver into the best coverage area of another receiver.

Features ● Benefits

Comparator

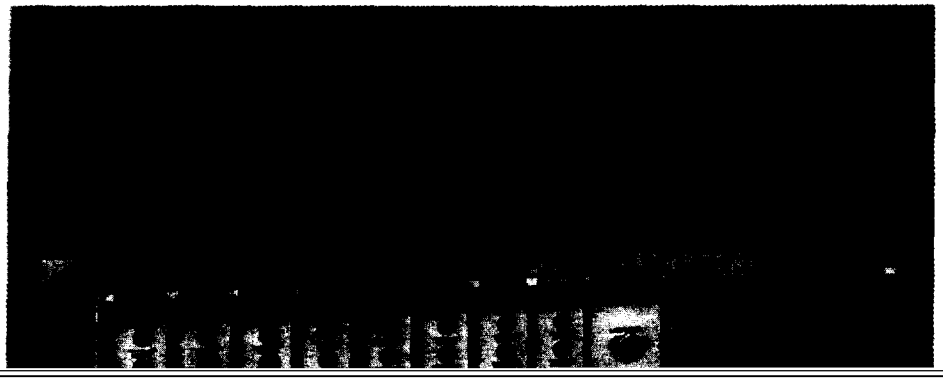
"Smart" Notch Filter.** Spectra-TAC satellite voting system features a "Smart" notch filter in the audio path that switches out whenever voice is present. ● The elimination of all notch filters when voice is present results in the clearest, sharpest audio quality available. Not available with tone keying module.

Automatic Line Level Adjustment: ● Prevents daily line changes from affecting the strength of the signal at the

*Provided input line sensitivity specification is met.

**The term "smart" refers to the module's sensing capability, not a filter used in some mobile telephone systems.

Comparator



Comparator. Line levels do not need to be readjusted constantly to reflect line changes.

Speed and Quality: The Comparator makes its first selection within 40 milliseconds with continuous selection occurring in less than 1 millisecond. Voting is accomplished with 2 dB steps. ● These features assure the best and most rapid audio quality selection.

Panel-Mounted LEDs: Provide Signal Quality Module status information ● indicating whether the receiver is voted, is unsquelched, or if there has been a failure.

Built-in Power Supply: ● Can be used with 120 or 240 volt, 50 or 60 Hz power sources, provides constant, regulated dc power to the Comparator even with significant drop in input voltage, as in power brown-out periods.

System Expansion Capability: Each Comparator chassis will handle up to 8 receivers. Additional Comparator models and Add-Comparator options are available to allow comfortable expansion to handle any feasible system requirement.

Line Outage Indication: Tells when a phone line has failed open or shorted.

Transient Protection: Prevents damage caused by phone line transients.

Light Emitting Diode Indicators: No light bulbs to replace.

–13 dB Status Tone: This continuous signalling tone (present when receiver is squelched) is set 13 dB below peak audio signal ● to maintain high audio quality while minimizing crosstalk and channel overloading on multiplex equipment.

Receiver

MICOR Radio Performance: ● The all solid-state Sensitron receiver, with its .35μV EIA SINAD sensitivity coupled with high selectivity and intermodulation rejection, ensures maximum system performance.

800 MHz Availability: ● All the advantages of Spectra-TAC receiver voting systems can now be applied to the clear spectrum of 800 MHz.

Full RF Shielding: ● Provides superior protection from RF interference at crowded sites.

Compact Size: The receiver package is designed for 19" (475 mm) rack mounting and is only 5¼" (131.25 mm) high. Several cabinet sizes are available to meet system needs.

Built-in Trickle Charger: ● Keeps optional battery charged for standby emergency operation.

Emergency Power Alert: ● A tone signal notifies the dispatcher that the receiver is on battery operation.

Built-in Equalizer: ● Provides correction for poor telephone line frequency response, maintains audio quality.

Built-in Test Oscillator included for Line Frequency Response Checks

Integral Power Supply: ● Provides 120/240V ac, 50/60 Hz operation.

Choice of Squelch: Models are available with Private-Line tone-coded squelch or with Digital Private-Line coded squelch.

IMTS Compatibility: ● All Spectra-TAC satellite receivers are fully compatible with Pulsar tone control IMTS systems, or optionally with DC control IMTS systems.

Options

Emergency Power and Alert is available on both the Receiver and Comparator for use in case of an AC power failure. The Receiver emergency power battery will supply 24 hours of operation for one Receiver/Encoder, while the Comparator emergency power battery will provide 8 hours of operation for a single Comparator chassis unit. Both have automatic battery recharge and notify the dispatcher of AC failure with periodic bursts of tone during receiver unsquelched periods.

Line Priority permits the control console in tone control systems to take over transmitter operation from the Comparator.

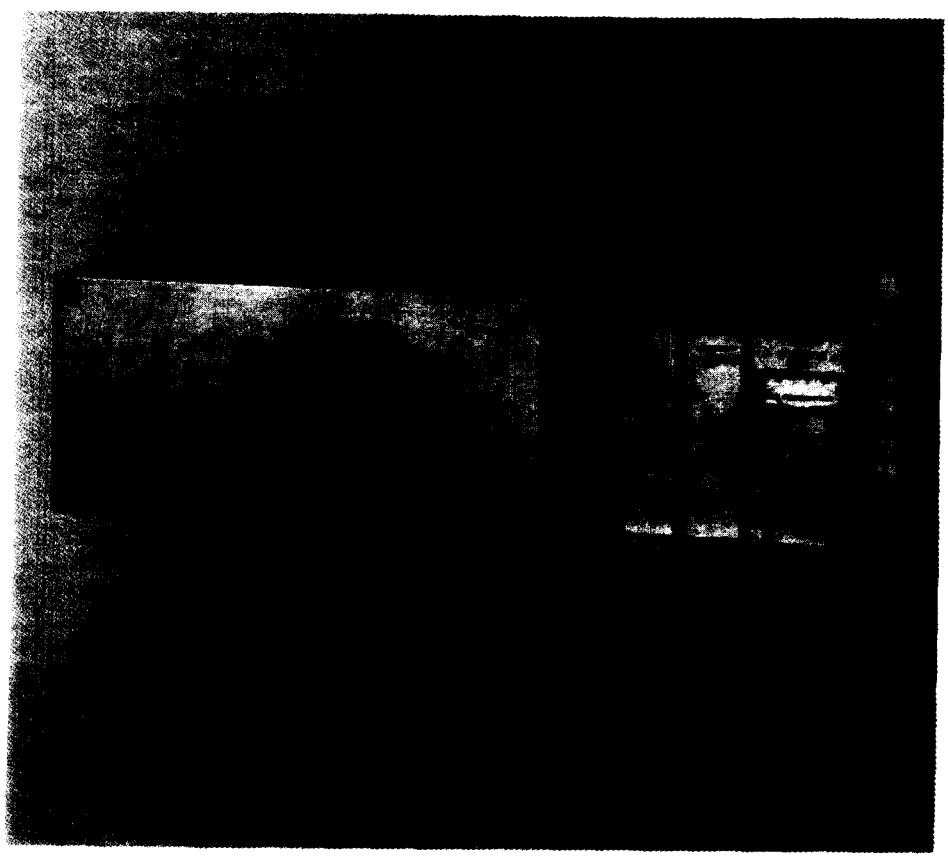
Secondary Line Driver allows the Comparator to act as a subcomparator in larger systems, or may be used to provide a second 600 ohm audio output.

Receiver Test Module allows the testing of all RF metering points, line level measurements, and a 20 dB quieting measurement. Local monitoring is provided by an integral 0.5 watt amplifier and speaker.

Receiver and Comparator Handsets: Provide system intercom capability.

Keying Modules: Provide tone and DC keying functions for repeater stations.

Receiver shown with optional test module installed.



Spectra-TAC satellite receiver voting system

Receiver-Encoder

ELECTRICAL	
Power Supply:	120/240V ac, 50-60 Hz Optional battery operation with automatic switchover and battery recharge.
Timing Carrier Squelch Receiver:	Status tone is removed within 40 milliseconds after receipt of a 20 dB quieting signal.
Timing Coded Squelch Receiver:	Status tone is removed upon operation of the receiver's coded squelch switching circuit.

MECHANICAL	
Receiver/Encoder:	5¼" x 19" rack panel 131.25 mm × 475 mm
Enclosures:	Indoor 30" cabinet holds up to 3 receiver-encoders and a multicoupler

Receiver

	132-174 MHz		406-420 MHz 450-512 MHz		806-821 MHz
EIA Modulation Acceptance:	±7 kHz minimum		±7 kHz minimum		±8 kHz minimum
Selectivity—EIA SINAD:	−100 dB at ±30 kHz* −95 dB with preamp		−90 dB at ±25 kHz −90 dB with preamp		−80 dB at ±25 kHz
Oscillator Frequency Stability:	Channel element maintains oscillator frequency within ±.0005% from −30°C to +60°C ambient (+25°C reference) (±.0002% using AFC optional)		Channel element and AFC maintain oscillator frequency within ±.0002% from −30°C to +60°C ambient (+25°C reference)		Channel element maintains oscillator frequency within ±.00025% from −30°C to +60°C ambient (+25°C reference)
	WITHOUT PREAMP	**WITH PREAMP**	**WITHOUT PREAMP**	**WITH PREAMP**	
Sensitivity—20 dB quieting:	Less than 0.5 μV	Less than 0.25 μV	Less than 0.5 μV	Less than 0.25 μV	Less than .5 μV
EIA SINAD: (Per EIA RS204B)	Less than 0.35 μV	Less than 0.175 μV	Less than 0.35 μV	Less than 0.175 μV	Less than .35 μV
Intermodulation—EIA SINAD:	−80 dB	−75 dB	−85 dB	−80 dB	−75 dB
Spurious & Image Rejection:	100 dB minimum	95 dB minimum	100 dB minimum	100 dB minimum	100 dB minimum
Squelch Sensitivity—Carrier Squelch (adjustable):	0.20 μV or less at threshold	0.10 μV or less at threshold	0.25 μV or less at threshold	0.125 μV or less at threshold	.25 μV or less at threshold
Coded Squelch (fixed):	0.20 μV or less	0.10 μV or less	0.25 μV or less	0.125 μV or less	.25 μV or less at threshold
Audio Characteristics: Ref. EIA RS 204B 6dB/Oct. de-emphasis characteristics 300-3000 Hz	Telephone Line: Output: +11 dBm at 600 ohms, balanced Response: +1, −3 dB Distortion: 3% at 1000 Hz Hum & Noise: −55 dB For Local Speaker (opt.): Output Available: ½ watt at 16 ohms Response: +2, −8 dB Distortion: 5% at 1000 Hz Hum & Noise: −50 dB		Telephone Line: Output: +11 dBm at 600 ohms, balanced Response: +1, −3 dB Distortion: 3% at 1000 Hz Hum & Noise: −55 dB For Local Speaker (opt.): Output Available: ½ watt at 16 ohms Response: +2, −8 dB Distortion: 5% at 1000 Hz Hum & Noise: −50 dB		Telephone Line: Output: +11 dBm at 600 ohms, balanced Response: +1, −3 dB Distortion: 3% at 1000 Hz Hum & Noise: −55 dB For Local Speaker (opt.): Output Available: ½ watt at 16 ohms Response: +2, −8 dB Distortion: 5% at 1000 Hz Hum & Noise: −50 dB
RF Input Impedance:	Nominal 50 ohms		Nominal 50 ohms		Nominal 50 ohms

*85 dB @ 25 kHz

Comparator

ELECTRICAL	
Power Supply:	120/240V ac, 50-60 Hz 13.8V dc
Input Line Impedance:	600 ohms, balanced
Input Line Sensitivity:	−38 dBm for status tone −25 dBm at 1000 Hz
Output Line Impedance:	600 ohms, balanced
Output Audio Level:	Adjustable, +11 dBm max.
Output Audio Response:	±1 dB from 300 to 3000 Hz with voice transmission
Output Audio Distortion:	Less than 3% at 1000 Hz
Unselected Channel Rejection:	−50 dBm
Timing:	Initial selection within 40 milliseconds. Change of selection in less than 1 millisecond. Dropout delay adjustable, 10 seconds maximum

MECHANICAL	
Comparator Chassis:	5¼" x 19" rack panel 131.25 mm × 475 mm
Comparator Capacity:	8, 16 or 24 site inputs, depending upon model.
Enclosures:	30" indoor Compa-Station cabinet (holds up to four comparator units).

System Attack Time

Carrier Squelch:	Audio is present at the output of the Comparator within 80 milliseconds after receipt of a 20 dB quieted signal.
Tone-Coded Squelch:	Audio is present at the output of the Comparator within 40 milliseconds after operation of the receiver's coded squelch switching circuit.

FCC Certification Numbers

132-174 MHz:	RC0107
406-512 MHz:	RC0108
806-821 MHz:	RC0134

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SECURENET

Digital Voice Protection System
"Spectra-TAC" Voting System